

CLAIMS

1. A process for producing high-resistance silicon wafers wherein it comprises subjecting silicon wafers obtained by the Czochralski method and having a resistivity of 100 Ωcm or above, an initial interstitial oxygen concentration of 8×10^{17} atoms/ cm^3 or above (ASTM F 121-1979) and, further, a carbon concentration of 5×10^{15} to 5×10^{17} atoms/ cm^3 (ASTM F 123-1981) to first heat treatment consisting in 0.5 to 5 hours of heat treatment at 850 - 1000°C employing a rate of heat-up of 0.5 to 10°C/minute at least in the temperature range of 700 - 850°C and, further, to second heat treatment consisting in 1 to 2 hours of heat treatment at 1150°C or above followed by subsequent lowering of the temperature and heat treating at 1000 - 1150°C for 2 to 10 hours.
2. A process for producing high-resistance silicon wafers according to claim 1, wherein when silicon wafers having an initial interstitial oxygen concentration of 13×10^{17} atoms/ cm^3 (ASTM F 121-1979) or above are used, heat treatment at 1150°C or above alone is carried out for 1 to 2 hours as the second heat treatment.
3. A process for producing high-resistance silicon wafers according to claim 1 or 2, wherein the first heat treatment and second heat treatment are carried out successively in a non-oxidizing atmosphere.
4. A process for producing high-resistance silicon wafers according to any of claims 1 to 3, wherein, when the silicon wafers obtained are subjected to heat treatment in the device manufacturing process, the amount of oxygen donors generated within the wafers is 1×10^{13} atoms/ cm^3 or below.
5. A process for producing high-resistance silicon wafers according to any of claims 1 to 3, wherein the silicon wafers obtained have a residual oxygen concentration of 6.5×10^{17} atoms/ cm^3 or above (ASTM F 121-1979) but 13.5×10^{17} atoms/ cm^3 or below (ASTM F 121-1979) and, when they are subjected to heat treatment in the device manufacturing process, the amount of oxygen

donors generated within the wafers is 1×10^{13} atoms/cm³ or below.

6. A method of producing epitaxial wafers wherein an epitaxial layer is formed on the surface of high-resistance silicon wafers obtained by the production process according to any of claims 1 to 5.

7. A method of producing SOI wafers wherein SIMOX type SOI wafers are produced using, as base substrates, high-resistance silicon wafers obtained by the production process according to any of claims 1 to 5.

8. A method of producing SOI wafers wherein bonded type SOI wafers are produced using, as base substrate side wafers, high-resistance silicon wafers obtained by the production process according to any of claims 1 to 5.